Testimony of

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Committee on Commerce, Science, and Transportation
Regarding
Fatigue and its Safety Effects on the Commercial Motor Vehicle and Railroad Industries
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Madam Chairwoman and Members of the Committee. I am pleased to represent the National Transportation Safety Board on the subject of fatigue and its safety effects on the commercial motor vehicle and railroad industries. Your hearing today will certainly highlight some of the work that has been done in this area, and will go far to evaluate the public's awareness of the problem.

Based on our investigative experience, we are very much aware of the pervasive adverse effects of sleep-related problems on transportation safety. Several high-profile accidents investigated by the Safety Board that involved fatigue included the grounding of the *Exxon Valdez* in Prince William Sound, Alaska, in 1989; the crash of a DC-8 in Guantanamo Naval Air Station in 1993; the failed commercial space launch of the Pegasus near Cape Canaveral, Florida, in 1993; the crash and explosion of a propane laden truck in White Plains, New York, in 1994; and the collision of two Union Pacific trains that collided near Delia, Kansas, in June 1997.

Fatigue problems permeate our entire society, placing a heavy toll on our safety, productivity, and quality of life. The factors contributing to fatigue are becoming increasingly prominent. As the demand for goods and the availability of transportation continues to grow, the time we want to wait for such services continues to decrease. Our society now demands that

goods be shipped anywhere in the country -- or even around the world -- overnight.

Although fatigue has assuredly been with us for a long time, it was not until the industrial age and the advent of complex machinery that fatigue became a major hazard to life and limb. Today, we need only drive from our homes, live near railroad tracks, or board an airplane to face first-hand potential dangers from operator fatigue. Also, our waters can be polluted by accidents like the *Exxon Valdez,* in which crewmembers suffer from fatigue.

In our investigations, the Safety Board has identified serious and continuing problems concerning the far-reaching effects of fatigue, sleepiness, sleep disorders and circadian rhythm disruption in transportation system safety. We have seen repeated instances of poor scheduling of work and rest periods in all the modes of transportation that have adversely affected the performance of the operating personnel.

These investigations also indicate that many transportation employees and supervisors fail to understand the problems associated with inadequate work and rest schedules. And, with few exceptions, management and labor segments alike fail to consider properly the harmful consequences that irregular and unpredictable work and rest cycles can have on people who operate vehicles.

What is interesting about fatigue is that we are not very good at judging when we are fatigued or the effects of fatigue on us. According to sleep researchers, tired people typically underestimate the extent of their fatigue, and therefore don’t make rational decisions about their fitness for duty.

We have all experienced the dramatic effects of extreme fatigue when we have tried to drive an hour longer than we should, or we tried to stay up to watch a movie or read a book. Often, the effects of fatigue are more subtle and, therefore, more insidious. But we are getting better at identifying fatigue, and, more importantly, we are learning how to counteract it. Much of the success in this area has been accomplished thanks to the work of scientists at NASA and other institutions who have developed an extraordinary body of research on fatigue and measures to counter the effects of fatigue.

In November 1995, the Safety Board co-sponsored a multi-modal symposium with the NASA Ames Research Center's Fatigue Countermeasures Program on the effects of fatigue in transportation. Nearly 600 people from 16 countries attended. The "Managing Human Fatigue in Transportation: Promoting Safety and Productivity" symposium highlighted the importance of fatigue countermeasures. Although the NASA countermeasures program, as well as the other research findings presented at the symposium, were developed for aviation, they can be adapted for the other modes of transportation as well.

As a result of our investigations and studies specifically targeting fatigue, the Safety Board has issued nearly 80 fatigue-related safety recommendations since 1972 to the Department of Transportation's (DOT) Federal Aviation Administration (FAA), Federal Railroad Administration (FRA), Federal Highway Administration (FHWA) and Coast Guard, as well as transportation operators, associations and unions. Human fatigue in transportation operations has been an issue on our "Most Wanted" list of safety improvements since the inception of the list in 1990.

In 1989, we issued three major safety recommendations to the DOT calling for a coordinated and aggressive federal program to study and address the fatigue problem in all modes of the transportation industry. Specifically, the Safety Board urged the DOT (1) to expedite a coordinated research program on the effects of fatigue, sleepiness, sleep disorders, and circadian factors on transportation system safety; (2) to develop and disseminate educational material for transportation industry personnel and management regarding shift work, work and rest schedules, and proper regimens of health, diet, and rest; and (3) to review and upgrade regulations governing hours of service for all transportation modes to assure that they are consistent and that they incorporate the results of the latest research on fatigue and sleep issues. In response to these recommendations, the Secretary of Transportation indicated his intent to emphasize human fatigue and sleep issues in the National Transportation Policy, and to include the modal administrations in a concerted effort to reduce the effect of fatigue on transportation safety.

More than nine years have elapsed since the Board issued these three recommendations to the DOT. We have been pleased with the amount of research that has been conducted regarding fatigue, as was evident at the Board symposium, and have, consequently closed recommendation (1) above as "Acceptable Action." We are also beginning to see an increase in the amount of educational material on fatigue being developed and disseminated to transportation industry personnel. However, we are very disappointed in the efforts to change the hours-of-service regulations. In our opinion, the Department of Transportation has failed to address one of the most important transportation safety issues facing our society today.

Highway and Human Fatigue

In 1990, the Safety Board released a study of 182 fatal-to-the-driver heavy truck accidents and found that driver impairment due to fatigue was the most frequently cited cause or factor (31 percent) of the accidents investigated.

As a result of this study, the Safety Board recommended that the FHWA require automated/tamper-proof on-board recording devices, such as tachographs or computerized logs, to identify commercial truckdrivers who exceed hours-of-service regulations. The intent of the recommendation was to provide a tamper-proof mechanism that could be used to enforce the hours-of-service regulations, rather than relying on drivers' handwritten logs. The current status of that recommendation is "Closed—Unacceptable Action."

On-board recording devices are an important tool not only with regard to monitoring hours of service but also as support in accident investigations. We believe they should be used universally. Closing this recommendation as "unacceptable action" reflects our disappointment in the FHWA and the trucking industry's failure to embrace advanced technology that will improve highway safety. The Safety Board believes that on-board recording devices in all modes of transportation are important, and we included a category of automated recording devices on our "Most Wanted" list of safety improvements last year.

A second Safety Board study regarding factors that affect fatigue in heavy truck accidents was issued in 1995. In that study, we found that the three most important factors in predicting a fatigue-related accident were (1) the duration of the last sleep period, (2) the total hours of sleep obtained during the 24 hours prior to the accident, and (3) the breaking of sleep into small blocks of time, or split sleep patterns.

As a result of that study, the Safety Board recommended that the FHWA revise the hours-of-service regulations. Specifically, the Board urged them to complete rulemaking within two years to revise the pertinent federal regulations to require sufficient rest provisions to enable drivers to obtain at least eight continuous hours of sleep after driving for 10 hours or being on duty for 15 hours. In November 1996, the FHWA issued an advance notice of proposed rulemaking requesting additional information on fatigue research/issues. The comment period was extended to mid-1997. According to the FHWA, they plan to issue a notice of proposed rulemaking (NPRM) in the fall or winter of 1998, if everything goes according to schedule. To say that we are disappointed that we have not yet reached the NPRM stage would be an understatement. Notwithstanding our support for research, we believe the results of our 1995 study of actual accidents and the wealth of scientific research already done provides concrete and sufficient evidence of the measures that affect fatigue in the accident environment and that the FHWA should proceed immediately to change the hours-of-service regulations. We believe further delays are unacceptable.

Madam Chairwoman, an example of an accident involving truckdriver fatigue may have occurred on September 1, 1998, near Holyoke, Colorado. A large schoolbus was struck in the rear by a tractor semitrailer. When it was stopped along the side of a road The truck came to rest on the roadway and the schoolbus rotated about 180 degrees and overturned onto its left side. Two students on the bus sustained major injuries and were airlifted to nearby hospitals.

After the accident, the truckdriver told the police that he thought he had fallen asleep. This is the third accident investigated by the Board's Office of Highway Safety in the past 2 ½

years in which a heavy truck has collided with the rear of a stopped schoolbus. I might mention that one of the accidents occurred in Chappell Hill, Texas, in April 1998. We are looking into the issue of truckdriver fatigue in all three of these accidents.

Railroad and Human Fatigue

For many years, the Safety Board has been concerned about the unpredictable nature of train crew work assignments and its effect on crew fatigue. Although there are some exceptions, most train crews are subject to call with little notice. The Board pointed out in its 1985 report on Burlington Northern Railroad collisions in Wiggins, Colorado, and Newcastle, Wyoming that railroad crews are subjected to the most unpredictable work/rest cycles in the transportation industry. We have investigated far too many accidents in which the lack of sleep and the irregular and unpredictable work schedule of train crews have been causal to the accidents.

Chairwoman Hutchison, it is the Safety Board's view that the Railroad Hours of Service Act is flawed. It was when it was first enacted in 1907, and has remained flawed through its substantial revision in 1969 and its amendments in 1976 and 1988. We believe that the Railroad Hours of Service Act encourages work schedules that combine excessive hours on duty and minimum opportunity for rest, and there is no scientific basis for the work/rest provisions in the current law. In addition, Board railroad accident investigations in which fatigue was a cause or factor show that train crew members were in full compliance with the Hours of Service laws. Let me expand these points.

The current railroad hours-of-service laws permit, and many railroad carriers require, the

most burdensome fatigue-inducing work schedule of any federally regulated transportation mode in this country. A comparison of the modes is revealing. The aviation, highway, marine and rail modes all have federally imposed limits on the amount of work and rest in a 24-hour period. The aviation and highway modes also impose weekly limits. Only aviation has monthly and annual limits. To keep the comparison simple, consider the number of hours an employee of each mode is permitted to work in the course of a 30-day month:

- A commercial airline pilot can fly up to 100 hours per month;

A truck driver can be on duty up to about 260 hours per month;
Shipboard personnel, at sea, cannot operate more than 360 hours per month, and only 270 hours per month when in port; and
Locomotive engineers can operate a train up to 432 hours per month, which equates to more than 14 hours a day on each of those 30 days.

We fail to understand why a locomotive engineer, or other train crew member, is permitted to work more than 4 times longer than an airline pilot, and 1.5 times longer than a truck driver.

Let me emphasize that we are not advocating reducing everybody's hours to 100 hours a month. Our point is that allowing any transportation worker in a safety-sensitive position—operating powerful equipment through our Nation's cities—to work more than 400 hours per month is excessive, if not downright unconscionable.

The Safety Board also believes that the hours-of-service laws have no scientific basis. In fairness to those who framed the laws in 1907, there was little more than anecdotal knowledge about fatigue at that time. But in the last two decades, the scientific and research communities

have conducted extensive in-depth studies of sleep and fatigue. We now know a great deal about the structure of sleep, the effects of human biological or circadian rhythms, and the debilitating effects that cumulative sleep loss has on alertness and health.

The railroad hours-of-service laws prescribe only maximum hours on duty and a minimum amount of rest in a 24-hour period. They do not take into account (1) how human circadian rhythms interact with the time of day when the work/rest periods take place, (2) the cumulative effects of working an unlimited number of successive days, or (3) the long-term health effects of various work/rest schedules. In short, it is time for a substantial scientifically-based revision to the Hours of Service Act. Unfortunately, little meaningful progress has been made, we believe, because the solution requires a fundamental change in habits and culture – and neither is easy to change. Labor has grown accustomed to the extra money earned and companies save money by employing fewer operators. This was made evident in testimony given at a recent Safety Board hearing on railroad safety. We must all recognize that fatigue is debilitating, and that fewer workers and more overtime are the fundamental ingredients for fatigue.

In all of the railroad accident investigations in which the Board has determined fatigue to be a causal or contributing factor, the train crew members were in full compliance with the hours-of-service laws. However, I should add that in a number of our investigations, some crew members did not avail themselves of the opportunity to get sleep during their off-duty period. The irregular schedules appear to be the problem in this industry. Generally, the traincrew either had an expectation that they would be called for duty at a later time, or their time off was during the day and they found it difficult to sleep.

While we applaud the work being done at some individual railroad companies, this problem is not unique to any one railroad. It is a national problem that is deserving of national attention. Reducing the hours-of-service parameters would prevent gross abuses of work hours and would provide a level playing field upon which all workers can be provided a healthier work environment.

I would like to share with you a fax that one of the Board's railroad investigators recently received from the widow of the engineer who was killed in the collision that occurred in July 1997 near Delia, Kansas. Her fax provides us with a poignant perspective on this issue:

> "On July 1, 1997, my husband Mike called the recording to find out when he would supposedly be going to work. Afterwards, he left to run errands. Later I called the recording too, but of course it said the same thing all day. That he was on the line-up for 5:00 p.m. That afternoon he came home and called it again. After listening he said 'well, as usual the lyin-ass line-up isn't holding up.' Mike and some of his co-workers called it the 'lyin-ass line-up,' being that it was so highly inaccurate. Several hours went by before they finally called him for 8:30 p.m. This was a common occurrence. He never knew when he would leave, how long he would be gone, or how long he would be home, either. He used to say our local weather forecaster was more reliable than the line-up. We could never plan anything. About the time he would decide to give up on the call and make other plans, they would call him to work. Sometimes he would be ready for work, 8 to 12 hours before he would finally receive a call. There is no other industry that I am familiar with, which is so unprofessional as to keep their employees uninformed about something as essential as their work schedule. The last time I called that recording, it was again inaccurate. It said Mike was still on duty. That was 8:30 a.m. July 2, 1997, approximately two hours after Mike was pronounced dead."

Madam Chairwoman, we as a government need to decide to what extent the status quo is acceptable. If we can agree that fatigue-caused accidents are unacceptable, then we must move to change the status quo.

That concludes my prepared statement. I will be happy to respond to any questions you may have.